REMARKS

In the Final Office Action, the Examiner rejected claims 1-20, 23-27, 92-109, and 113-137. Applicants canceled claims 21, 22, 28-91, 110-112, and 138-140 in a previous communication. However, for the at least the reasons set forth below, Applicants respectfully submit that all of pending claims 1-20, 23-27, 92-109, and 113-137 are allowable in their present form. Applicants respectfully request reconsideration of the above-referenced application in view of the following remarks.

Rejections Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 1-20, 23-27, 113-117, 120-128, and 130-137 under 35 U.S.C. § 103(a) as unpatentable over Lampotang et al. (U.S. Patent No. 6,597,939) in view of Strauss (U.S. Patent No. 6,467,472). The Examiner also rejected claims 92-109, 118, 119, and 129 under 35 U.S.C. § 103(a) as unpatentable over Lampotang et al. in view of Strauss and Orlando (U.S. Patent No. 4,657,025). Additionally, the Examiner rejected claims 1-20, 23, 25-27, 92-105, 107-109, 113-133, and 135-137 under 35 U.S.C. § 103(a) as unpatentable over Watrous (U.S. Patent No. 5,967,981) in view of Orlando and Strauss. Further, the Examiner rejected claims 24, 106, and 134 under 35 U.S.C. § 103(a) as unpatentable over Watrous in view of Orlando, Strauss, and Lampotang et al. Applicants respectfully traverse these rejections.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the

claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988).

Moreover, non-analogous art cannot properly be pertinent prior art under 35 U.S.C. § 103. *In re Pagliaro*, 210 U.S.P.Q. 888, 892 (C.C.P.A. 1981). For the teachings of a reference to be prior art under 35 U.S.C. § 103, there must be some basis for concluding that the reference would have been considered by one skilled in the particular art working on the particular problem with which the invention pertains. *In re Horne*, 203 U.S.P.Q. 969, 971 (C.C.P.A. 1979). The determination of whether a reference is from a non-analogous art is set forth in a two-step test given in the case of *In re Wood*, 599 F.2d 1032, 1036, 202 U.S.P.Q. 171, 174 (C.C.P.A. 1979). *See also, e.g., Union Carbide Corp. v. American Can Co.*, 724 F.2d 1567, 220 U.S.P.Q. 584 (Fed. Cir. 1984); *Bott v. Fourstar Corp.*, 218 U.S.P.Q. 358 (E.D. Mich. 1983). In *Union Carbide*, the court noted that, under the *Wood* test, the first determination was whether "the reference is within the field of the inventor's endeavor." If it is not, one must proceed to the second step "to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved." In regard to the second step, the *Bott* court stated that "analogous art is that field of art which a person of ordinary skill in the art would have been apt to refer in attempting to solve the problem solved by a proposed invention." "To be relevant the area or art should be 'where one of ordinary skill in the art would be aware that similar problems exist'." *Bott*, 218 U.S.P.Q. at 368 (quoting *Stevenson v. ITC*, 204 U.S.P.Q. 276, 280 (C.C.P.A. 1979).

Request Removal of Non-Analogous Art

Based on the foregoing two-part non-analogous art test, the Strauss reference does not qualify as analogous art. In regard to the first step of the *Wood* test, it is readily apparent that the Strauss reference is not within the field of Applicants' endeavor. Particularly, the present application is generally directed to the field of imaging systems and control of such systems. *See* Application, page 1, lines 5-9. In stark contrast, the Strauss reference is directed to the field of internal combustion engines, such as those mounted on boat. *See* Strauss, col. 1, lines 6-10; FIG. 1. Applicants respectfully submit that imaging systems and boat engines are clearly not within the same field of endeavor.

In regard to the second step of the *Wood* test, i.e., pertinence of the reference to the problem addressed by Applicants, the present application is generally concerned with the problem of artifacts in an image that are caused by physiological motion within a subject. *See* Application, page 3, lines 9-29. Particularly, in discussing the problem faced by the inventors, the present application states:

> In MRI systems, as with many other medical imaging systems, images are often desired in physiological features undergoing cyclical movement. *Unfortunately, the cyclical movement causes motion artifacts in the image.* To minimize motion artifacts, an image acquisition sequence may be gated to the physiological cycle (e.g., a cardiac cycle, a respiratory cycle, etc.). However, the physiological cycle can vary over time. This complicates the gating process. In cardiac imaging, an electrocardiogram (ECG) may be used to measure electroactivity before motion occurs and, thereby, facilitate image acquisition at the desired state of the cardiac. However, there are many disadvantages of using convention ECG techniques for image acquisition control. For example, conventional techniques do not measure the actual physiological activity to control the image acquisition timing. Moreover, electrocardiograms require actual "intrusive" contact with the subject that may interfere with some diagnostic systems. *Conventional techniques also fail to provide accurate timing control that can keep up in real-time*

> *with the time varying physiological motions, such as cardiac activity.*
>
> There is a need, therefore, for an improved technique of triggering image acquisition. In particular, a technique is needed for predicting physiological activity, and specific events thereof, based on actual physiological activity. *There is also a need for a real-time correction technique suitable for adjusting timing predictions based on prior occurrences of actual physiological activity.*

Id. (emphasis added).

In the Office Action, the Examiner argued that the problem that Applicants were faced with was "not a medical problem or an imaging problem but one that deals with providing proper timing signals." *See* Office Action mailed April 5, 2006, page 6. This asserted problem, however, is an apparent overgeneralization and oversimplification of both the problem actually faced by Applicants, as evidenced in the portion of the application cited above, and Applicants' arguments provided in the Response filed March 14, 2006.

As noted above, in the present application, the particular problem faced by Applicants was reducing motion artifacts in an image. The Strauss reference is not reasonably pertinent to this problem and, therefore, the internal combustion engine of the Strauss reference cannot be considered analogous to an imaging system that reduces motion artifacts.

The Examiner, instead of addressing the general problem faced by Applicants, appears to be focusing on an illogical generalization of a subset of this problem. Particularly, in addressing the problem of motion artifacts, a portion of Applicants' technique is concerned with enhancing the accuracy of the *prediction* of *future* occurrences of physiological activity within a subject, which is based, at least in part, on

comparing the time of a predicted future occurrence to the actual time of that occurrence. *Id.* Conversely, the Strauss reference is directed to measuring an attenuated exhaust pressure of a boat engine that approximates a *historical* average exhaust pressure. *See* Strauss, col. 6, lines 1-12. The Strauss apparatus then uses the attenuated exhaust pressure to adjust various controllable engine parameters, such as fuel injection and ignition, in real-time to ultimately control fuel-air mixture and combustion within the engine and to reduce emissions from the engine. *See id.*, col. 4, lines 30-34; col. 6, lines 22-33. The Strauss reference, at best, discloses approximating a historic average of *past* exhaust pressure and adjusting other parameters based on the contemporaneous approximation.

The Strauss reference does not disclose, teach, or even hint at predicting *future* measurements, much less refining the accuracy of such predictions based on a deviation of a predicted measurement from an actual measurement. Indeed, the Strauss reference appears to be devoid of any mention of prediction of future events. The Examiner attempts to generalize the prediction and accuracy enhancement problems addressed by the Applicant to a problem of "providing proper timing signals." This generalization appears to have little basis in fact or reason and no supporting rationale was provided in support of this mischaracterization of the problem. Additionally, even assuming for the sake of argument that the Examiner's mischaracterization of the problem faced by Applicants was reasonable, the Examiner's arguments with respect to the Strauss reference would still be based on an incorrect assumption that all timing problems are analogous. *See, e.g.*, M.P.E.P. § 2141.01(a) (citing *In re* Oetiker, 977 F.2d 1443 (Fed. Cir. 1992) (comparing a "hook" of a garment in a prior art reference with a "hook" for a hose clamp of an application, and reasoning that not all hooking problems are analogous)).

The Strauss reference simply is not reasonably pertinent to the problem faced by Applicants. Moreover, the Examiner has not met her burden, and in fact has not provided

any rationale, as to why one skilled in the art concerned with predicting *future events* and *enhancing the accuracy* of such predictions would have thought to consider a reference directed to a combustion engine, the parameters of which can be adjusted based on *past events*. Still further, the Examiner has not provided any logical rationale as to why the Strauss reference would have commended itself to Applicants' attention. *See Wang Laboratories, Inc. v. Toshiba Corp.*, 993 F.2d 858 26 U.S.P.Q.2d 1767 (Fed. Cir. 1993) (noting that a reference is reasonably pertinent if it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention considering his problem). Additionally, the Examiner has failed to provide a compelling argument as to why one skilled in the art would even be aware that similar problems exist in the exceedingly disparate fields of medical imaging devices and combustion motors. *See Bott*, 218 U.S.P.Q. at 368. Accordingly, for at least these reasons, the Strauss reference must be considered non-analogous art. Consequently, Applicants respectfully request removal of the Strauss reference from consideration.

Omitted Features of Independent Claims 1, 92, and 113

Applicants respectfully note that each of the Examiner's various rejections of the present claims relies on the non-analogous Strauss reference. Upon the proper removal of the reference from consideration, the remaining art fails to establish a *prima facie* case of obviousness with respect to any of independent claims 1, 92, and 113, or their respective dependent claims. For at least these reasons, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103 and allowance of claims 1-20, 23-27, 92-109, and 113-137.

As a final matter, Applicants note that, even if the Strauss reference *could* be considered analogous art, the various combinations of references cobbled together by the Examiner fail to disclose each element of independent claims 1, 92, and 113. For example, the Strauss reference fails to support the Examiner's assertions with respect to the elements of the present claims allegedly taught by this reference. As such, the present

art of record cannot support a *prima facie* case of obviousness with respect to the present claims. However, because of the clear deficiencies of the rejections discussed above, further discussion concerning the additional deficiencies of the rejections is believed to be superfluous. Consequently, for the sake of simplicity and efficiency, Applicants simply reserve the right to elaborate on these additional deficiencies at a future time.

Conclusion

In view of the remarks set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: June 5, 2006

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